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IS/QC 960501-3-1 (2007): Electromechanical switches for use in electronic equipment, Part 3: Sectional specification for in-line package switches , Section 1 Blank detail specification [LITD 3: Electromechanical COmponents and Mechnical Structures for Electronic Equipment]

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अनुभाग 1 ब्लैंक डिटेल विशिष्टि

Indian Standard

ELECTROMECHANICAL SWITCHES FOR USE IN ELECTRONIC EQUIPMENT

PART 3 SECTIONAL SPECIFICATION FOR IN-LINE PACKAGE SWITCHES

Section 1 Blank Detail Specification

ICS 31.220.20

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

October 2007 **Price Group 4**

Electromechanical Components and Mechanical Structures for Electronic Equipment, LITD 03

NATIONAL FOREWORD

This Indian Standard which is identical with IEC 61020-3-1 : 1991/IEC QC 960501 : 1991 'Electromechanical switches for use in electronic equipment — Part 3: Sectional specification for in-line package switches — Section 1 — Blank detail specification' issued by the International Electrotechnical Commission (IEC) was adopted by the Bureau of Indian Standards on the recommendation of the Electromechanical Components and Mechanical Structures for Electronic Equipment Sectional Committee and approval of the Electronics and Information Technology Division Council.

The text of IEC Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards. Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear referring to this standard, they should be read as 'Indian Standard'.

b) Comma (,) has been used as a decimal marker, while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

In this adopted standard, reference appears to certain International Standards for which Indian Standards also exist. The corresponding Indian Standards, which are to be substituted in their respective places, are listed below along with their degree of equivalence for the editions indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
IEC 61020-1/IEC QC 960000 (1991) Electromechanical switches for use in electronic equipment — Part 1: Generic specification	IS QC 960000 : 1995/IEC QC 960000 : 1991 Electromechanical switches for use in electronic equipment: Part 1 Generic specification	Identical
IEC 61020-3/IEC QC 960500 (1991) Electromechanical switches for use in electronic equipment — Part 3: Sectional specification for in-line package switches	IS QC 960500 : 1999/IEC QC 960500 : 1991 Electromechanical switches for use in electronic equipment: Part 3 Sectional specification for in-line package switches	do
IEC 60068-1 (1982) Environmental testing — Part 1: General and guidance	IS 9000 (Part 1) : 1988 Basic environmental testing procedures for electronic and electrical items: Part 1 General (*first revision*)	Technically Equivalent

Only the English text of the International Standard has been retained while adopting it as an Indian Standard, and as such the page numbers given here are not same as in the IEC Publication.

IS QC 960501 : 2007
IEC QC 960501 : 1991

Indian Standard

ELECTROMECHANICAL SWITCHES FOR USE IN ELECTRONIC EQUIPMENT

PART 3 SECTIONAL SPECIFICATION FOR IN-LINE PACKAGE SWITCHES

Section 1 Blank Detail Specification

INTRODUCTION

A blank detail specification is a supplementary document to the sectional specification and contains requirements for style, lay-out and minimum content of detail specifications.

Detail specifications not complying with these requirements shall not be considered as being in accordance with the IECQ System nor shall they so be described.

The complete requirements for the switches described herein shall correspond to this detail specification and the current issues of IEC 1020-1 and IEC 1020-3.

In the preparation of detail specifications, the content of 1.5 of IEC 1020-3, shall be taken into account.

Pages 9 through 19 provide the framework for a detail specification which is completed by inserting the necessary information.

The numbers between brackets on the first page correspond to the following information which shall be inserted in the position indicated.

Identification of the detail specification

[1] The International Electrotechnical Commission or the national standards organization under whose authority the detail specification is drafted.
[2] The IEC or national standards number of the detail specification, date of issue and any further information required by the national system.
[3] The number and issue of the IEC or national generic specification.
[4] The number and issue of the IEC blank detail specification.

Identification of the switch

[5] A short description of the type of in-line package switch which shall include as a minimum the information needed for listing on the qualified products list.
[6] A circuit diagram or short description of the electrical circuit(s).
[7] Dimensions important for interchangeability. When space permits, the drawing may also include detailed dimensions. The drawing shall comply with 1.5.1 of IEC 1020-3.

[8] Information on the typical construction (when applicable).
[9] Assessment level.

Ratings and characteristics

[10] Basic characteristics of the switch.

The appropriate information for the tests in IEC 1020-1 and 1020-3 shall be provided in 1.2. Values shall be stated for the following ratings and characteristics which are mandatory:

- contact resistance;
- electrical endurance;
- electrical ratings;
- voltage proof.

Values shall be stated in 1.2 for the following characteristics when the following conditions exist (mandatory if applicable):

- low air pressure when an altitude rating is declared;
- logic level endurance when a logic level rating is declared;
- low level endurance when a low level rating is declared;
- type of panel seal when a panel seal is declared;
- robustness of actuator;
- robustness of terminations;
- solderability when the terminals are declared to be solderable;
- resistance to soldering heat when the terminals are declared to be solderable.

[1]

Generic specification number
ELECTRONIC COMPONENTS OF ASSESSED QUALITY IN ACCORDANCE WITH:

[3]

Outline drawing –
Maximum enclosure dimensions
(angle of projection . . .)

[7]

NOTES

1 See figure ☐ for full dimensional requirements.

2 Dimensions are denoted as follows: $\frac{0{,}0 = \text{mm}}{0{,}000 = \text{in}}$

3 For detail dimensions, see ...

4 Shape is optional within the specified dimensions.

Detail specification number [2]

Blank detail specification number [4]

Product description [5]

Electrical circuit [6]

Constructional details [8]

Assessment level [9]

Information on the availability of components qualified to this specification is given in the qualified products list.

1 General data

1.1 *Dimensions*

(See [7] on page 5. It may be convenient for some of this information to be given in tabular presentation.)

1.2 *Ratings and characteristics*

1.2.1 *Electrical ratings*

Power	__ V, __ A (insert values)
Logic level	(insert "5 V, 10 mA" or "not applicable")
Low level	(insert "30 mV, 10 mA" or "not applicable")

1.2.2 *Environmental ratings*

Climatic category	.../.../... (insert values in accordance with IEC 68-1)
Low air pressure	(insert values of test voltage and air pressure or "not applicable")
Rapid change of temperature	(insert "applicable" or "not applicable")
Salt mist	(insert test duration or "not applicable")
Shock	(insert acceleration (... *g*) and duration or "not applicable")
Vibration	(insert acceleration and frequency range or "not applicable")

1.2.3 *Mechanical characteristics*

Functional operation	(insert special circuit and detent characteristics if applicable)
Immersion in cleaning solvents	(insert "applicable" or "not applicable")
Mass	(insert maximum value if required)
Operating characteristics	(insert values for the applicable force and/or for movement characteristics)
Panel seal	(insert type of seal according to 4.14 of IEC 1020-1 or "not applicable")
Robustness of:	
- actuator	(insert force or torque value)
- termination	(insert "22.5°" or "45°" if applicable)
Solderability	(insert type of test according to 4.13 of IEC 1020-1 or "not applicable")

1.2.4 *Electrical characteristics*

Capacitance	(insert maximum value or "not applicable")
Contact bounce	(insert maximum duration or "not applicable")
Contact disturbance	(insert "applicable" or "not applicable")
Contact resistance (insert type)	(insert "... Ω maximum" or "not applicable")
Electrical overload	(insert "applicable" or "not applicable")
Endurance	
- electrical (insert test type)	(insert cycles of operation and any other required test details)
- logic level	(insert cycles of operation or "not applicable")
- low level	(insert cycles of operation or "not applicable")
- mechanical (insert test type)	(insert cycles of operation or "not applicable")
Insulation resistance	(insert minimum resistance or "not applicable")
Voltage proof	(insert value of test voltage)

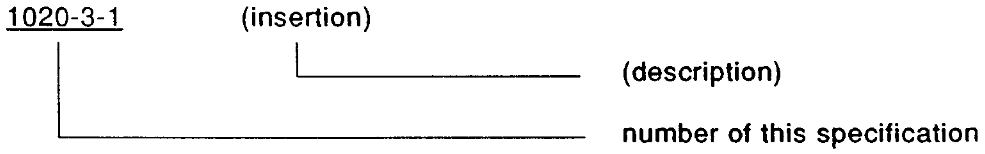
1.3 *IEC switch type designation*

Switches covered by this detail specification shall be described by the following in the order shown:

a) the IEC publication number for this detail specification;

b) (insert and describe additional categories as required).

Example of IEC type designation: 1020-3-X (insertion)



1.4 *Marking*

The marking of the switch and package shall be in accordance with the requirements of 2.5 of IEC 1020-1. (Insert the details of marking on the switch and on the package, including any special marking requirements.)

1.5 *Ordering information*

Orders for switches covered by this specification shall contain the following information as a minimum:

a) the applicable part number according to 1.3;

b) "in accordance with IEC 1020-3-(X), (X) edition" (insert the number and edition of the detail specification);

c) when certified records of released lots are required, include "CERTIFIED RECORDS REQUIRED".

1.6 *Certified records of released lots*

Insert the information required by 3.5.1 of IEC 1020-1.

1.7 *Additional information (not for inspection purposes)*

1.7.1 *Safety considerations*

The user shall consider the suitability of the switch with regard to any safety requirements applicable to the equipment.

1.8 *Increased severities or requirements which are additional to those specified in the generic and/or sectional specification*

NOTE - Additional or increased requirements should be specified only when essential.

1.9 *Common features*

2 Inspection requirements

2.1 *Structurally similar devices*

Insert principles of structural similarity for the type covered.

2.2 *Pre-conditioning*

2.3 *Qualification approval inspection*

Qualification approval inspection requirements shall be in accordance with table 1 in IEC 1020-3 with all details and requirements taken from tables 1 and 2 in the detail specification.

2.4 *Quality conformance inspection*

Quality conformance inspection is prescribed in table 1 for lot-by-lot inspections and in table 2 for periodic inspections.

For visual examination, the determination of major and minor defects shall be as follows: (insert description of defects).

2.5 *Sampling procedure details*

Table 1 - Test schedule for lot-by-lot inspection

Subclause number and test designation (see note 1)	D or ND	Assessment level	
		IL	AQL
GROUP A (non-destructive)			
4.3.1 Visual examination	ND	II	1 %
4.4.2 Contact resistance (see note 3)	ND	II	1 %
4.3.5 Functional operation	ND	II	1 %
4.4.4 Insulation resistance	ND	S2	1 %
4.5.1 Voltage proof	ND	S2	1 %
4.3.6 Operating characteristics	ND	S2	1 %

NOTES

1 The subclause numbers of the test and performance requirements refer to Part 1 of IEC 1020, the supplementary requirements being specified in this part of IEC 1020.

2 In this table:

D = destructive
ND = non-destructive
IL = inspection level
AQL = acceptable quality level.

3 The appropriate test method shall be specified in the detail specification.

Table 2 - Test schedule for periodic inspections

Subclause number and test designation (see note 1)	M, MA or WS	Conditions of test (see note 1)	Sample size and criterion of acceptability (see note 2)				Performance requirements (see note 1)
			p	n	td	c	
GROUP B (destructive)				3		1	
4.13 Solderability (see note 3)	MA						
GROUP C (destructive)			12	10		1	
4.10 Electrical endurance (voir note 3)	M	. . . cycles . . . V, . . . A, load			1		Sticks/misses ≤ . . . per. . . cycle
4.4.2 Contact resistance (see note 3)	M	. . . V, . . . A			1		R ≤ . . . mΩ
4.4.4 Insulation resistance	WS	. . . V			1		R ≥ . . . MΩ
4.5.1 Voltage proof	M	. . . V			1		Leakage current ≤ . . . µA
4.3.6 Operating characteristics	WS				1		Within limits
4.14 Panel seal (see note 3)	MA				0		No water ingress
4.15 Enclosure seal (see note 3)	MA				0		Leak rate ≤ . . .
GROUP D (destructive)			36				
(Re-qualification according to IEC1020-3)							

NOTES

1 The subclause numbers of the test and performance requirements refer to Part 1 of IEC 1020, the supplementary requirements being specified in this part of IEC 1020.

2 In the groups, all specimens shall be subjected to the required tests and all tests shall be performed in the sequence shown.

3 The appropriate test method shall be specified by the detail specification.

4 In this table:
M = test is mandatory
MA = test is mandatory if applicable to the switch design
WS = test is mandatory when specified by the detail specification
n = sample size
td = test acceptance criterion (permitted number of defectives per test)
c = group acceptance criterion (permitted number of defectives per group)
p = periodicity in months
NA = not applicable

5 When the detail specification includes additional tests, additional test groups may have to be added.

Bureau of Indian Standards

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Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

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Amendments Issued Since Publication

Amendment No.	Date of Issue	Text Affected

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